

# Bloody nipple discharge in an infant

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## Abstract

Bloody nipple discharge (BND) is rare in the pediatric age. Mammary duct ectasia presents as its main cause. This entity can be very distressing because of its association with breast cancer in adults; however, most infancy and childhood breast lesions are benign. The diagnostic approach should be conservative, with ultrasound being the preferred method of evaluation. The usual treatment is watchful clinical observation because BND is usually self-limited with spontaneous resolution. We report the case of a previously healthy 8-month-old female infant with normal development. She presented with a right BND with 3 days of evolution; the left breast was normal. Ultrasound of the right breast revealed dilated mammary ducts. A conservative approach was chosen with follow-up in a pediatric consultation. A month later, a similar episode occurred, lasting only 1 day. Subsequently, there has been no recurrence of the nipple discharge. The patient is now 18 months old and has no residual symptoms.

## Keywords

Bloody nipple discharge, breast pathology, infant, mammary duct ectasia, milky nipple discharge, ultrasound.

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## How to cite

Rodrigues CF, Silva N. Bloody nipple discharge in an infant. *J Pediatr Neonat Individual Med.* 2022;11(1):e110105. doi: 10.7363/110105.

## Introduction

Bloody nipple discharge (BND) in infancy and childhood is extremely rare, with the first known case report published in 1956 [1]. In adults, it can be associated with breast cancer, resulting in several invasive diagnostic procedures. Therefore, BND in infants can be very distressing for parents and health care providers, although all reported cases have been found to be benign processes [2-6]. Findings after surgical approaches in some BND cases confirm the benignity of the underlying process, with different etiologies, such as mammary duct ectasia (MDE), gynecomastia, and fibrocystic lesions [7, 8]. MDE is the most common etiology [3-5, 9, 10], and a conservative approach is possible, with a gradual BND resolution in weeks to months [10-12]. Some noninvasive approaches can help in the diagnostic approach, such as breast ultrasound, frequently showing dilation of the retroareolar mammary ducts [13]. Cytologic and microbiologic analysis of BND can also be useful in select cases to eliminate other causes [7, 14]. We present a case describing a unilateral BND in an infant, because we consider awareness of this pathology important to avoid unnecessary and invasive diagnostic tests.

## Case report

An 8-month-old female infant presented with a 3-day history of right unilateral BND (**Fig. 1**) that was not spontaneous, occurring with stimulation of the breast. The parents denied trauma, breast discomfort, or change in the size of the nipple, as well as a history of fever or a recent infection. Previously, she was a healthy infant, exclusively breastfed up to 4 months, with a weight evolution in the 15<sup>th</sup>-50<sup>th</sup> percentile. Her mother did not ingest any drugs during pregnancy or while breastfeeding, except for vitamins. There was a maternal great aunt history of breast cancer, with no family history of coagulopathy or endocrine disorders. On physical examination, the patient was in good general condition, with right serosanguinous nipple discharge after palpation, without local inflammatory signs, palpable breast masses, or pain, and had a normal left breast. The remaining physical examination was unremarkable, with adequate feminine genitalia. The breast ultrasound revealed dilated mammary ducts in the right breast, and no further exams were performed, namely hormonal and cytologic evaluation of the nipple discharge. A watchful

clinical observation approach was chosen, with no active treatment initiated. A month later, a similar episode occurred, with a darker discharge, lasting 1 day (**Fig. 2**). The mother associated the



**Figure 1.** An 8-month-old female infant presented with a 3-day history of right unilateral bloody nipple discharge (BND).



**Figure 2.** A month later, a similar episode occurred, with a darker discharge, lasting 1 day.

occurrence of the 2 episodes with extremely hot days. Nipple discharge resolved spontaneously, and no recurrence or residual symptoms were detected in the follow-up examinations at 12 and 18 months of age.

## Discussion

Breast enlargement with or without a thin milky discharge is relatively common and a normal finding in newborns and infants, in both males and females [6, 15, 16]. Milky discharge is a benign condition linked to placenta-transmitted maternal and fetal hormones and to an infant's endocrine changes in the first months of life [5, 15, 16]. BND is a rare entity during the pediatric age, with the most common cause being MDE [2-5], a benign condition characterized by dilated mammary ducts and periductal fibrosis and inflammation [2, 3, 9]. The most affected ducts are in the subareolar region, but peripheral ducts may be involved [3, 9]. BND is often a cause for concern because of its association with breast cancer [4, 9], with an association with malignancy in 5% to 15% of cases in adults. However, most of the breast lesions in the pediatric age are benign [3], and there are no reported cases of breast cancer in preschool-aged infants, being exceedingly rare in children and adolescents [4, 6].

The etiology of BND remains unclear [2, 3]. It is believed to be multifactorial, linked to the hormonal adaptation process in the first months of life [2, 9] and to the predisposition to duct dilatation associated with environmental influences (inflammation and obstruction, among others). Estrogens and progesterone promote the ductal system and mammary alveoli growth, respectively. A relationship has been described with the passage of hormones through breast milk, so that cessation of breastfeeding would produce a regression of MDE [9]. However, BND is documented both in infants receiving exclusive breast milk and in infants being formula-fed, as well as in older children [2]. Other less frequent etiologies can be bacterial infection, trauma, gynecomastia, fibrocystosis, hemorrhagic cysts, mammary epithelial hyperplasia, intraductal papilloma, autoimmune reactions, hematophagocytosis, extramedullary hematopoiesis, and benign phyllodes tumors [4, 7, 9, 12, 17]. We found no evidence in the literature to support the occurrence of BND on hot days, as suggested by the mother of this infant.

MDE is very rare in children, with ages reported from 2 months to older than 10 years and a male-to-female ratio of 10:4 in childhood [3, 9]. BND is the most common symptom of MDE [3], with other reported symptoms being breast enlargement and a palpable mass [18]. The discharge may be unilateral or bilateral [3, 9]. Bilateral involvement suggests benignity rather than unilateral disease in general [3] and is essentially always due to an endocrinologic or physiologic process [6]. However, in infants, both bilateral and unilateral discharge is likely to be benign [2]. If no obvious cause is found in the spontaneous nipple discharge of children or adolescents, they should be referred to an appropriate specialist (e.g., pediatric endocrinologist, pediatric gynecologist) [6].

Prolactinomas in the pediatric age can present as a milky discharge, usually bilateral. Other symptoms are headache, visual defects, and amenorrhea (in females). Mastitis is uncommon in infants and usually presents as a unilateral erythema and breast pain. A purulent or multicolored nipple discharge may be present, but BND is unlikely [2]. MDE may be mistaken for infantile gynecomastia, which typically occurs in neonates due to exposure to maternal hormones and spontaneously resolves within the first 2 years of life [3]. Other causes of serosanguineous nipple discharge are intraductal papilloma, fibrocystic changes, or cancer [6, 17].

Because the spectrum of breast lesions in the pediatric age is benign, the diagnostic approach to the condition should be conservative [2, 13, 19-22]. Ultrasound is the modality of choice for the evaluation of underlying disease of nipple discharge in infancy and childhood [3]. The evidence for the need of an ultrasound is scarce, but it is a painless method of evaluation, noninvasive, and has no adverse effects [2]. The most common finding on ultrasound is dilated ducts, and it is often diagnostic [4, 9, 13, 18, 22, 23]. Because MDE is usually mild, a breast ultrasound may be normal and, in these cases, the cytological study of the discharge can guide the diagnosis if ductal epithelial cells and histiocytes are present [4, 9]. In the presented case, there was no need to perform a cytological study because the ultrasound revealed dilated mammary ducts. If there are signs suggestive of infection, a culture of the discharge should be performed [4]. Biopsy and surgical intervention should be avoided, given the benign nature of the disease and because of the risk of deformity to the developing breast [3, 5, 11]. If the nipple discharge occurs with manipulation or stimulation of the breast, a

benign cause should be considered, as we found in this case. However, if the discharge is spontaneous and persistent, and accompanied by a palpable mass, it may be malignant and a more invasive study is recommended [4, 9]. If the discharge does not cease in approximately 9 months, a pediatric surgical appointment should be considered [2].

The treatment of MDE is usually conservative with a watchful clinical observation, because the symptoms disappear spontaneously in 1 to 9 months [4, 9-13, 19-22]. In the reported case, the last episode occurred 9 months earlier, and symptoms are not expected to recur. Manipulation of the nipple is not recommended, because it increases the risk of ulceration of the ductal epithelium, bleeding, and bacterial colonization [4]. Local excision may be indicated in case of palpable nodules, rapidly progressive masses, or protrusion through the nipple [9], but in the pediatric age MDE is usually self-limited [3, 19-22].

In summary, BND in infants is a benign entity that resolves spontaneously. This case shows the importance of awareness of this diagnosis, because careful clinical follow-up is secure and allows avoidance of invasive measures to establish a diagnosis, limiting sequelae related to surgical procedures.

### Declaration of interest

The Authors declare that there were no conflicts of interest in conducting this work. There were no external funding sources for this paper.

### References

1. Myers MB, Kaplan IW. Bleeding from the nipple in infancy due to cystic ductal hyperplasia of the breast. *Ann Surg.* 1956;143(4): 557-60.
2. Kelly VM, Arif K, Ralston S, Greger N, Scott S. Bloody nipple discharge in an infant and a proposed diagnostic approach. *Pediatrics.* 2006;117(4):e814-6.
3. Moon S, Lim HS, Ki SY. Ultrasound Findings of Mammary Duct Ectasia Causing Bloody Nipple Discharge in Infancy and Childhood. *J Ultrasound Med.* 2019;38(10):2793-8.
4. Ascaso Matamata ÁM, Amiguet Biain M, Morales Ferruz R, Sobrevia Elfau MT, González García G. [Duct ectasia, an infrequent condition in childhood: A case report]. [Article in Spanish]. *Arch Argent Pediatr.* 2018;116(6):e782-4.
5. Acer T, Derbent M, Hiçsönmez A. Bloody nipple discharge as a benign, self-limiting disorder in young children: A systematic review including two related case reports. *J Pediatr Surg.* 2015;50(11): 1975-82.
6. Banikarim C, De Silva NK. Breast disorders in children and adolescents. Available at: <https://www.uptodate.com/contents/breast-disorders-in-children-and-adolescents>, last update: February 2020, last access: October 2020.
7. Imamoglu M, Cay A, Reis A, Ozdemir O, Sapan L, Sarihan H. Bloody nipple discharge in children: possible etiologies and selection of appropriate therapy. *Pediatr Surg Int.* 2006;22(2):158-63.
8. Harmsen S, Mayatepek E, Klee D, Meissner T. Bloody nipple discharge (BND) in an 8 months old girl and a 9 months old male – rational diagnostic approach. *Klin Padiatr.* 2010;222(2):79-83.
9. Zegpi MS, Downey C, Vial-Letelier V. [Mammary duct ectasia in children: A case report]. [Article in Spanish]. *Rev Chil Pediatr.* 2015;86(4):287-90.
10. Fouda EY, Al Shamrani K, Al Hamdi A, Al Jurebi M, Dahlan H, Erwi S, Al Ahmari F, Rana N. Mammary duct ectasia with bloody nipple discharge in a 5-month-old infant: A case report. *J Pediatr Surg Case Rep.* 2017;18:24-6.
11. Berkowitz CD, Inkelis SH. Bloody nipple discharge in infancy. *J Pediatr.* 1983;103(5):755-6.
12. Pampal A, Gokoz A, Sipahi T, Dogan H, Ergur AT. Bloody nipple discharge in 2 infants with interesting cytologic findings of extramedullary hematopoiesis and hemophagocytosis. *J Pediatr Hematol Oncol.* 2012;34(3):229-31.
13. De Praeter C, De Coen K, Vanneste K, Vanhaesebrouck P. Unilateral bloody nipple discharge in a two-month-old male. *Eur J Pediatr.* 2008;167(4):457-9.
14. Gupta V, Yadav SK. Infantile bloody nipple discharge: a case report and review of the literature. *Afr J Paediatr Surg.* 2009;6(1):63-4.
15. Nascimento M, Portela A, Espada F, Fonseca M. Bloody nipple discharge in infancy – report of two cases. *BMJ Case Rep.* 2012;2012:bcr2012006649.
16. Aydin R, Gul SB, Polat AV. Detection of duct ectasia of mammary gland by ultrasonography in a neonate with bloody nipple discharge. *Pediatr Neonatol.* 2014;55(3):228-30.
17. Tourlamain G, Quaegebeur K, Dedeurwaerde F, Logghe K. Juvenile Papillomatosis in a Young Child: A Case of Infantile Bloody Nipple Discharge. *J Pediatr Adolesc Gynecol.* 2020;33(6):720-2.
18. Djilas-Ivanovic D, Boban J, Katanic D, Ivkovic-Kapicl T, Lucic MA. Bilateral bloody nipple discharge in a male infant: sonographic findings and proposed diagnostic approach. *J Pediatr Endocrinol Metab.* 2012;25(1-2):163-4.
19. Weimann E. Clinical management of nipple discharge in neonates and children. *J Paediatr Child Health.* 2003;39(2):155-6.
20. Zaid A, Carolan E, Sharif F. Bloody nipple discharge in a 7-month-old boy. *BMJ Case Rep.* 2011;2011:bcr0120113761.
21. George AT, Donnelly PK. Bloody nipple discharge in infants. *Breast.* 2006;15(2):253-4.
22. Ujue H, Akiyama M, Osawa R, Shida S, Aoyagi S, Shimizu H. Bloody nipple discharge in an infant. *Arch Dermatol.* 2009;145(9): 1068-9.
23. Corapçioğlu F, Akanse G, Sarper N, Taneri H, Yildiz K. Mammary ductal ectasia as cause of bloody nipple discharge in a 28-month-old boy. *Turk J Pediatr.* 2005;47(4):379-81.